What is claimed is:

1. A microvalve for controlling fluid flow comprising:
   (a) a body portion having a plurality of spaced openings formed therein;
   (b) a shutter located adjacent to and substantially parallel with said body portion, said shutter having a plurality of spaced openings formed therein;
   (c) an electrostatic drive mechanism for causing said shutter to move with respect to said body portion so that said spaced openings of said shutter are brought into and out of alignment with said spaced openings of said body portion, wherein said microvalve is in an open position and a closed position, respectively; and
   (d) a latching mechanism for preventing said shutter from moving with respect to said body portion.

2. The microvalve of claim 1, wherein said shutter is biased in said closed position.

3. The microvalve of claim 2, said latching mechanism being utilized to prevent said shutter from moving when in said open position.

4. The microvalve of claim 1, wherein said shutter is biased in said open position.

5. The microvalve of 4, said latching mechanism being utilized to prevent said shutter from moving when in said closed position.

6. The microvalve of claim 1, said shutter further comprising:
   (a) a substantially rectangular frame having a first pair of sides substantially parallel to said spaced openings and a second pair of sides substantially perpendicular to said spaced openings; and
   (b) a plurality of spaced finger-like members extending between said second pair of frame sides defining said spaced openings therebetween.

7. The microvalve of claim 6, said latching mechanism further comprising:

(a) an ear extending from at least one of said second pair of frame sides; and

(b) an electrostatic comb drive positioned adjacent each of said second pair of frame sides having said ear, wherein said electrostatic comb drive is movable so as to engage and disengage said ear and thereby prevent and permit said shutter from moving, respectively.

8. The microvalve of claim 6, said latching mechanism further comprising at least one electrostatic comb drive positioned adjacent at least one of said second pair of frame sides, wherein said electrostatic comb drive is movable so as to engage and disengage said shutter frame and thereby prevent and permit said shutter from moving, respectively.

9. The microvalve of claim 8, wherein said shutter forms a spine for said electrostatic comb drive.

10. The microvalve of claim 6, wherein said drive mechanism is an electrostatic comb drive attached to each of said first pair of frame sides.

11. The microvalve of claim 1, said shutter further comprising:

(a) a substantially circular frame having a center portion; and

(b) a plurality of spaced members extending between said center portion and said frame defining said spaced openings therebetween.

12. The microvalve of claim 11, said latching mechanism further comprising:

(a) an ear extending from said frame; and

(b) an electrostatic comb drive positioned adjacent said frame proximate said ear, wherein said electrostatic comb drive is movable so as to engage and disengage said ear and thereby prevent and permit said shutter from moving, respectively.

13. The microvalve of claim 11, said latching mechanism further comprising at least one electrostatic comb drive positioned adjacent said frame, wherein said electrostatic comb drive is movable so as to engage and disengage said shutter frame and thereby prevent and permit said shutter from moving, respectively.

14. The microvalve of claim 11, wherein said drive mechanism is an electrostatic comb drive attached to said frame.

15. The microvalve of claim 1, wherein power to disengage said latching mechanism is maintained only during a change in position of said shutter.

16. The microvalve of claim 1, wherein power to said drive mechanism is maintained only while said latching mechanism is disengaged.

17. The microvalve of claim 1, wherein a predetermined amount of fluid is able to leak through said microvalve in the closed position.

18. The microvalve of claim 1, wherein said shutter is movable to a position intermediate said open and closed positions so as to permit a partial opening of said microvalve.

19. The microvalve of claim 1, wherein said drive mechanism causes said shutter to move linearly with respect to said body portion and said latching mechanism prevents said shutter from moving with respect to said body portion.

20. The microvalve of claim 1, wherein said drive mechanism causes said shutter to move non-linearly with respect to said body portion and said latching mechanism prevents said shutter from moving with respect to said body portion.

21. The microvalve of claim 1, further comprising a controller for providing power to said drive mechanism and said latching mechanism.

22. A method of electrostatically actuating a microvalve controlling fluid moving perpendicular to said microvalve between a first position and a second position, said microvalve including a shutter located adjacent a body portion comprising the steps of:

(a) disengaging a latching mechanism so as to permit movement of said shutter with respect to said body portion;
(b) actuating a drive mechanism to move said shutter from said first position to said second position with respect to said body portion; and
(c) engaging said latching mechanism so as to prevent movement of said shutter from said second position.

23. The method of claim 22, said disengaging step occurring immediately prior to and during movement of said shutter.

24. The method of claim 22, said actuating step occurring only while said latching mechanism is disengaged.

25. The method of claim 22, further comprising the step of biasing said shutter in said first position.

26. A fluid-breathing voltaic battery comprising:

(a) a container;
(b) a voltaic cell disposed within said container; and
(c) a fluid exchange system comprising:
    (1) [a] an electrostatic microvalve having a first state and a second state, said microvalve being disposed in said container such that said microvalve is located between a fluid flow and said cell, wherein said microvalve is adapted to allow a fluid into said cell when said microvalve is in said first state and to substantially

prevent said fluid from flowing into said cell when said microvalve is in said second state; and

(2) a controller electrically connected to said microvalve, said controller being adapted to initiate a change of state in said microvalve;

(3) a latching mechanism for retaining said microvalve in one of said first and second states.

27. A method of fabricating an electrostatic microvalve, comprising the following steps:

(a) providing a first wafer having a top surface and a bottom surface;

(b) providing a masking material on said top surface of said first wafer;

(c) providing a second wafer having a top surface and a bottom surface;

(d) etching a plurality of spaced openings on said top surface of said second wafer;

(d) bonding said bottom surface of said first wafer to said top surface of said second wafer via a sacrificial layer;

(e) etching said masking material of said first wafer to create a shutter and a plurality of actuators operative therewith;

(f) etching a portion of said second wafer so as to create a passage in flow communication with said spaced openings etched on said top surface thereof; and

(g) removing a portion of said sacrificial layer between said first and second wafers to release said actuators.

28. An electrostatic microvalve, comprising:

(a) a first wafer having oxide on a top surface thereof, wherein said top surface is etched to create a shutter, a plurality of actuators operative with said shutter, and a latching mechanism to prevent movement of said shutter;

(b) a second wafer having a plurality of spaced openings etched on a top surface thereof, wherein a portion of said second wafer in substantial alignment with said spaced openings is etched therefrom so as to create a passage in flow communication therewith; and

(c) a sacrificial layer positioned between said first and second wafers to bond said first and second wafers, said sacrificial layer having a portion removed in substantial alignment with said flow passage so as to release said actuators.

29. The electrostatic microvalve of claim 28, wherein a thickness for said sacrificial layer is predetermined so as to permit a designated leakage flow through said microvalve when spaced openings in said shutter are not in alignment with said spaced openings in said second wafer.